IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Takao William WARRILLOW et al. Atty. Ref.: 2380-1368

Serial No. 10/581,999 TC/A.U.: 2474

Filed: March 20, 2007 Examiner Awet A. HAILE

Confirmation No.: 9272

For: METHOD AND DEVICE FOR MANGING RESOURCES SHARED BY DIFFERENT OPERATIONS IN A COMMUNICATION SYSTEM

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September 13, 2011

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Commissioner for Patents
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Applicants request review of the final rejection in the above-identified Application. No amendments are being filed with this request. This request is being filed with a notice of appeal. The review is requested for the reason(s) stated below.

SUBJECT MATTER OF THE APPEAL

In the final Office Action dated April 13, 2011, the Examiner rejects claims 22-36, 39-44 and 46, which are the subject matter of this appeal, under 35 U.S.C. §103(a) as allegedly being unpatentable over Cecile et al. (EP 1220557A1, *hereinafter Cecile*) in view of Johansson et al. (U.S. Publication No. 2004/0219912 A1, *hereinafter Johansson*). Claims 22, 40, 41 and 46 are independent and are directed to a method, a device, an arrangement comprising a device, and a node for managing resources in a communication system having resources shared by at least two operators.

When administering shared resources, somewhat contradictory objectives – efficiency and fairness – are considered. Fairness can be achieved by strictly dividing the available resources such that each operator is allocated a portion and cannot go over its allocated portion. However, efficiency would not be maximized in a global sense. On the other hand, if resources are managed together without any concern about which operator uses which resource, one may end up in a congestion situation where one operator is denied resources despite the fact that the operator has not yet fully utilized its allocated portion. *Original disclosure, p.6, ll.5-20.*

In an aspect to address the problem described above, control is provided over how shared resources are used by different operators to achieve an optimum combination of efficiency and fairness. Generally, during non-congested situations, all connections are accepted. This means that an operator can exceed its allocated proportion when the resources are abundant. However, at or close to congestion, a new connection for the operator is accepted if the operator's agreed upon proportion is not exceeded. *Original disclosure, p.6, ll.22-30.*

Fig. 2 of the disclosure (reproduced below left) schematically illustrates shared resources as a rectangle in which the area of the rectangle corresponds to the total resources "C" shared by three operators who are allocated portions Cp1, Cp2 and Cp3. Also, u1, u2, and u3 represent the amount of shared resources actually in use respectively the three operators. Further, β represents a

congestion threshold; Δ represents the amount of free resources (unused portion of the shared resources); and Ra, Rb, Rc and Rd represent new access requests that respectively require ra, rb, rc and rd amount of resources to satisfy the request. Ra and Rd are requests from operator 1 while Rb and Rc are from operator 2.
Original disclosure, p.7, ll.8-30.

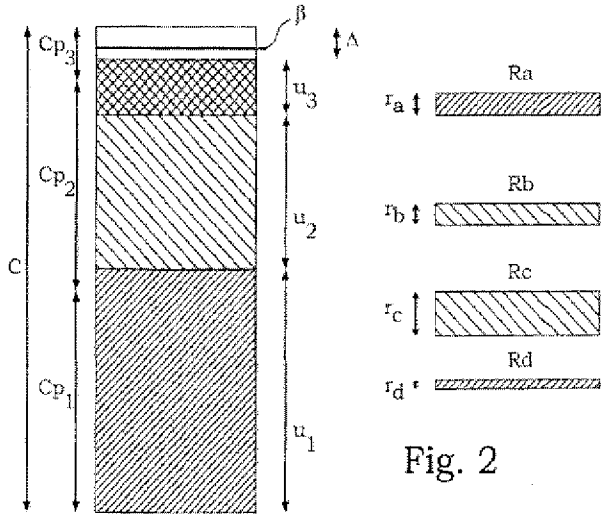


Fig. 2

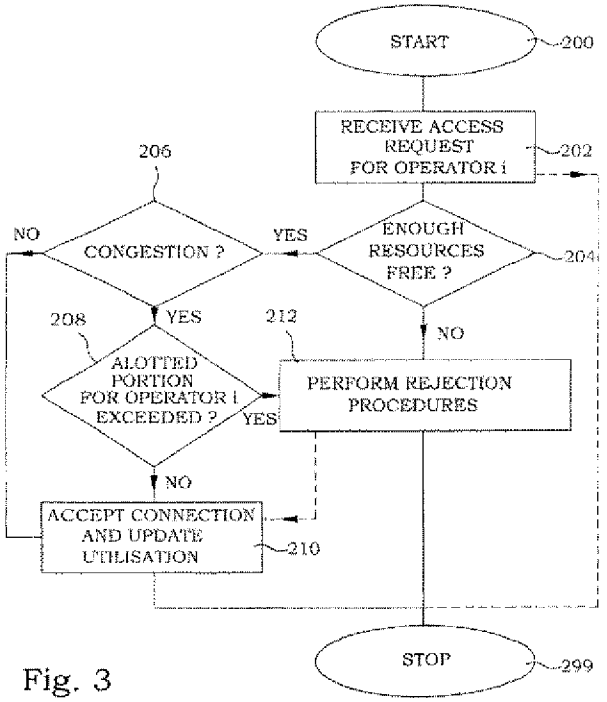


Fig. 3

Fig. 3 of the disclosure (reproduced above right) illustrates a flow diagram of an example method for managing resources that are shared by at least two operators. As seen, upon reception of an access request for an operator (step 202), a first determination is made on whether there are sufficient free resources (step 204). If there are sufficient resources, then a second determination is made on whether or not the system will be congested by the request (step 206). If the system won't be congested, then the connection is accepted (step 210). Thus, it is seen that when there is an abundance of resources, the connection is accepted which maximizes efficiency. On the other hand, if the system will be congested, then a third determination is made on whether or not the requesting operator has used up its allocated portion (step 208). If the operator has not fully used up its portion, the requested is accepted (step 210). If the operator has used up its allocated portion, then the request is rejected (step 212). In this way, fairness is achieved so that even during times of congestion, access for an operator who has not used up its allocated portion is not denied.

This is explained with reference to Fig. 2 in which the following are assumed:

- ra=rb<Δ, rc>Δ, rd<Δ;
- sum(u1,u2,u3,ra)= sum(u1,u2,u3,rb)> β, sum(u1,u2,u3,rd)<β; and
- u1>Cp1, u2<Cp2.

For the request Rc, since there are not enough free resources (rc>Δ in step 204), the requested is denied in step 212. For other requests Ra, Rb and Rc, the method proceeds to step 206 to make the second determination (of congestion).

In one aspect, the second determination is made by determining whether or not a total amount of the resources shared by the operators in use in the system exceeds a first threshold. In Fig. 2, the first threshold corresponds to the congestion threshold β. Thus, for the request Rd, since granting the request will not cause congestion (sum(u1,u2,u3,rd)<β) in step 206, the connection is accepted in step 210. For requests Ra and Rb, since granting the request would cause congestion

(sum(u1,u2,u3,ra)= sum(u1,u2,u3,rb)> β) in step 206, the method proceeds to step 208 to make the third determination (of operator allocated portion use).

The third determination in one aspect is made by determining whether a total amount of resources shared by at least two operators in use for an operator exceeds a second threshold. In Fig. 2, the second threshold corresponds to Cp1, Cp2 and Cp3 for the operators. For the request Ra, since operator 1 is already using more than its allocated portion (u1>Cp1) in step 208, the request is denied in step 212. However, for the request Rb, operator 2 is not yet using all its allocated portion u2<Cp2. Therefore, the connection is accepted in step 210.

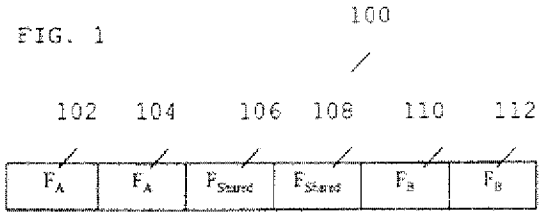
PRIMA FACIE CASE OF OBVIOUSNESS NOT ESTABLISHED

The Examiner commits clear errors in alleging claims 22-36, 39-44 and 46 to be unpatentable over Cecile and Johansson. To reject claims under 35 U.S.C. §103(a), a *prima facie* case of obviousness must be established. *See M.P.E.P. 2142.* One requirement to establish the *prima facie* case of obviousness is that the prior art references, when combined, must teach or suggest all claim limitations. *See M.P.E.P. 2142; M.P.E.P. 706.02(j).* The Cecile and Johansson combination fails to do so. For example, independent claims 22 recites, in part "executing a third determination whether a total amount of said resources shared by the at least two operators in use for the first operator exceeds a second threshold." Cecile and Johansson, individually or in combination, fails to teach or suggest this feature.

The Examiner relies upon [0061]-[0062] and [0069] of Cecile to allegedly teach executing the third determination. *Office Action, p.3.* Cecile is directed to a method for dynamic inter-Operator resource sharing. *Cecile [0001].* Cecile notes that there are several spectrum utilization techniques ranging from extremes of fixed carrier assignment (FCA) and dynamic carrier assignment (DCA). In FCA, each operator is strictly allocated a fixed amount of spectrum. In DCA, all frequencies are pooled and are made available to all operators. Cecile notes that there are disadvantages with both utilization techniques. *Cecile [0002]-[0010].*

To address these issues, Cecile proposes a hybrid carrier assignment (HCA) mechanism in which a portion of the spectrum is allocated to an operator and another portion is available for shared use among the operators. Cecile illustrates this in Fig. 1 in a block diagram 100 of a spectrum allocation arrangement with frequency sharing of frequencies 102-112. Operator A has "proprietary frequencies" FA 102, 104 and Operator B has its own proprietary frequencies FB 110, 112. Two frequencies F_{Shared} 106, 108 are the only shared frequencies. *Cecile, [0032 – 0034].*

FIG. 1



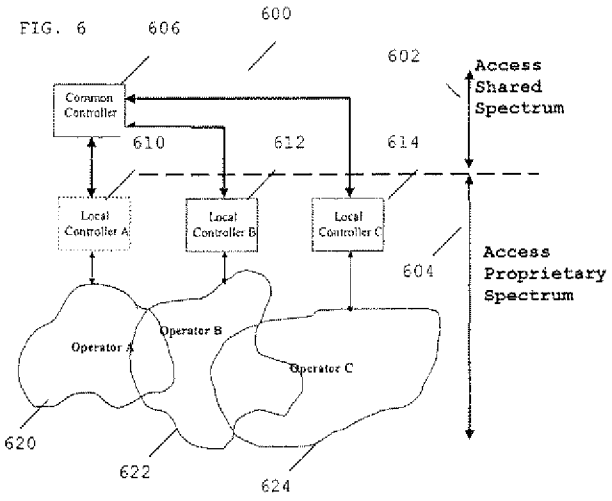
In Cecile, the proprietary resources behave as FCA resources, and all shared resources behave as DCA resources. Regarding the circumstance illustrated in Fig. 1, Cecile states "In this case, each network can potentially use up to four frequencies." *Cecile [0034].* For example, Operator A can be allocated one or both shared frequencies 106, 108 in one instance, and Operator B can be allocated one or both shared frequencies 106, 108 in another instance.

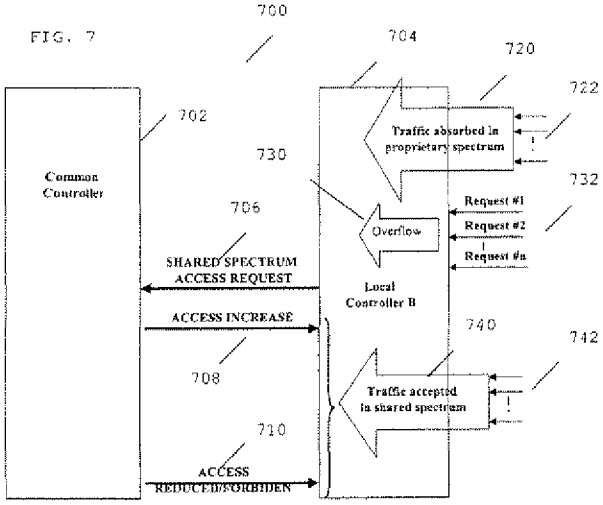
The following is important. First, it bears repeating that in Cecile, only the respective network is able to use its own proprietary frequencies. *Cecile, [0034].* In other words, only the F_{Shared} frequencies 106, 108 are resources that are shared between the two operators. The proprietary frequencies 102, 104, 110, 112 are not shared resources, and thus are irrelevant.

Second, in Cecile, there is no concept of allocating portions of the shared resources among operators. That is, Cecile does not contemplate allocating some portion of the shared

frequencies 106, 108 to one operator (e.g., 40% to operator A) and allocating another portion of the same shared frequencies another operator (e.g., 60% to operator B). Indeed, there is no such need in Cecile since each operator can call upon its proprietary frequencies whenever the need arises.

In the Office Action, the Examiner relies upon [0061]-[0062] and [0069] of Cecile to allegedly teach executing the third determination. *Office Action, p.3.* These paragraphs describe an architecture (Fig. 6 reproduced below left) for dynamic inter-Operator spectrum sharing and a method (Fig. 7 reproduced below right) for signaling exchange between a local controller of an operator and a common controller (CC).





Paragraph [0061] lists the information that can be exchanged between the common controller (CC) and different operators. For example, CC can broadcast that a given frequency is available for sharing. As another example, an operator 620, 622, 624 can request to use a frequency available for sharing. Paragraph [0062] merely indicates that when a shared spectrum is no longer available, an "ACCESS FORBIDDEN" message can be sent. In paragraph [0069], Cecile merely indicates that upon analyzing an access request for the shared spectrum from a local controller 704, the common controller 702 will send an ACCESS INCREASE message to the local controller 704 if sufficient bandwidth can be offered to the operator on the shared spectrum.

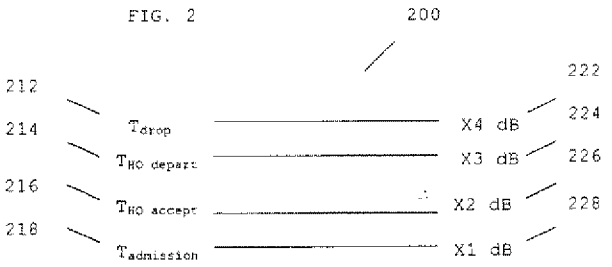
Regarding the claimed third determination, the Examiner characterizes Cecile as disclosing "determining whether shared resources use by an operator exceeds target threshold assigned to the operator." The Examiner mistakenly interprets Cecile's target threshold as being equivalent to the claimed second threshold.

Paragraph [0069] in its entirety reads:

> After analyzing the access request, based on a current utilization of the shared spectrum and other concurrent access requests, the CC 702 will send an ACCESS INCREASE message 708 to the local controller B704, if bandwidth can be offered to the Operator B on the shared spectrum. It is within the contemplation of the invention that the ACCESS INCREASE message 708 will contain the set of target thresholds to be applied by the Operator. This is enough to inform Operator B that it is allowed to access the shared spectrum.

The target thresholds in [0069] refer to the four thresholds Tadmission (new call admission threshold), THOaccept (hand-over requests admission threshold), THOdepart (hand-over departure

threshold) and Tdrop (drop threshold) introduced in paragraph [0039]. As seen in Fig. 2 of Cecile (reproduced below right), these thresholds are expressed in decibels (dB). For example, incoming mobile users are admitted until a noise-rise of X1 dB (Tadmission) is reached. Mobile users being handed over from other cells are accepted until X2 dB (THOaccept) is reached. When X3 dB (THOdepart) is reached, some mobile users are handed over. Finally, some mobile users are dropped when the noise-rise reaches X4 dB (Tdrop). *Cecile [0041].*



As mentioned above, the claimed second threshold corresponds to the portion of the shared resources allocated to an operator (e.g., Cp1, Cp2, Cp3). But as seen in paragraphs [0039 – 0046], Cecile's target thresholds are completely different – these are merely thresholds of noise at which am operator will admit mobile users, accept handovers of mobile users from other cells, handover mobile users to other cells, and finally drop mobile users.

One of ordinary skill would realize that the target thresholds in Cecile have nothing to do with amount of resources whatsoever. Simply put, Cecile fails to teach or suggest the feature of "executing a third determination whether a total amount of said resources shared by the at least two operators in use for the first operator exceeds a second threshold" as recited in claim 22.

Since Johannsson does not teach or suggest this feature as well, the Examiner correctly does not rely upon Johansson to correct for this deficiency of Cecile. For this reason alone, the rejection of claim 22 based on the combination of Cecile and Johansson is clearly erroneous. For similar reasons, the rejections of independent claims 40, 41 and 46 are also clearly erroneous. The rejections of claims 23-36, 39, 42-43 and 44 are also clearly erroneous by virtue of their dependencies from independent claims as well as on their own merits.

CONCLUSION

As shown by the above analysis of the references, no reference alone or in combination with any other reference(s) renders the present claims unpatentable. There is no disclosure of the claimed subject matter, nor is the claimed subject matter rendered obvious. The rejections should be withdrawn. For reasons including those set forth above, upon pre-appeal review it is respectfully requested that the prior art rejections be withdrawn and the pending claims allowed.

Respectfully submitted,

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